APPENDIX E

SURFACE GEOPHYSICAL SURVEYS

ENVIROPROBE SERVICE INCORPORATED

GEOPHYSICAL INVESTIGATION REPORT

PERFORMED AT:

FWEC/Church Road TCE Site
Mountain Top, PA 18707

PREPARED FOR:

Tetra Tech
1000 The American Rd
Morris Plains, NJ 07950

PREPARED BY:

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February 8, 2011

1.0 INTRODUCTION

Enviroprobe Service, Inc. (Enviroprobe) is an environmental investigation services firm which provides monitoring well installation (HSA), Geoprobe (DPT) drilling services and Environmental & Engineering Geophysics (EEG) services to the environmental consulting and engineering community.

Enviroprobe conducted a subsurface geophysical investigation at the subject property within client-specified areas of concern. The investigation used the direct current (DC) electrical resistivity and seismic refraction methods to investigate the depth to the bedrock.

An Advanced Geoscience SuperSting R8 resistivity system was utilized to perform the DC electrical resistivity survey. The system is an 8-channel electrical resistivity data acquisition system which can be 8 times as fast as the old R1 resistivity system. A 24-channel Geometrics Geode seismic data acquisition system was used to perform the seismic refraction survey. A differential global positioning system (DGPS) and a total station were also utilized for the horizontal positioning and the topography of the geophysical survey lines.

2.0 SCOPE OF WORK

From October to December, 2010, geophysicists and technicians from Enviroprobe Service Inc. were mobilized to the subject property to perform a geophysical investigation. The purpose of the investigation was to estimate the depth to the top of the bedrock. The investigation areas included lines inside and outside the facility.

In the facility, there were 7 lines in the MIP areas and 4 other lines. Outside the facility, there were 13 lines. Both the DC resistivity survey and the seismic refraction survey were performed along each line. The electrode spacing for the resistivity surveys was 10 feet and the geophone spacing for the seismic surveys was 10 feet for short lines or 20 feet for long lines (>230 feet).

For lines longer than the cable spreads, the resistivity data was collected utilizing the roll-along technique (2 cables, with 14 electrodes each) for efficient data collection. The seismic data was collected in each section of each long line with overlapping; and data from all the sections within each long line were then combined for processing.

The program RES2INV of Geotomo Software and SeisImager2D of Geometrics were used to process the data.

3.0 SURVEY RESULTS

The positions of the geophysical survey lines are shown in Figure 1. Their coordinates of all survey lines are presented in a separate AutoCAD file in the electronic format. The coordinate system in the AutoCAD file is State Plane, Pennsylvania North, 1983, in US survey feet. Note that because of the topography, the actual horizontal length of the lines could be slightly shorter than the footages noted on them.

There are totally 24 lines, with 11 lines inside the facility. Inside the facility, there are 3 lines in MIP1 area and 4 lines in MIP2 area. Line 3 of MIP1 area (MIP1-3) actually extended through MIP2 area. The other four lines inside the facility are named as Facility 1 to 4. Outside the facility, the lines are designated as OF 1 to 13. The data results, including the resistivity transects, interpreted depth to the interfaces and seismic P wave velocities (feet/s), are presented in separated image files. The P wave velocities is also listed in Table 1.

1. MIP areas

In general, the resistivity data in the MIP areas suffered significantly from the cultural noises (reinforced concrete, underground utilities, and other subsurface metallic structures). The seismic data were affected by the concrete as well. The data qualities in these two areas were poor. But the general interface dipping directions (mainly to the west) were still observable from the data. The ground surface was flat in these two areas and its elevation was arbitrarily set to 0 in the data transects.

MIP1-1: The seismic refraction survey was not successful due to the concrete where the seismic waves traveled faster than in the underlying layers. From the resistivity transect, we can see the trend that the elevation of the subsurface interface is higher at the end (northeast) while lower at the beginning (southwest). The middle section of the transect was affected by some noises and it's unclear where the interface was.

MIP1-2: The seismic data interpretation shows highest subsurface interface elevation in the middle of the line, but it's suspected that the seismic data was biased by the concrete on the ground surface. The actual interface topography is suspected as a flat slope as shown in the resistivity data, with higher elevation at the end of the line. Note that the low resistivity zone in the middle of the resistivity transect between 130 and 160 foot was most likely caused by cultural noises.

MIP1-3: Similar to line MIP1-2, the subsurface interface elevation generally was lower at the start and higher at the end of line. This trend can be observed from both seismic and resistivity data.

MIP2-1: Similar to MIP1-3, the subsurface interface elevation was higher to the east (close to the railroad). The seismic data and the resistivity data agree with each other well.

MIP2-2: The general trend of the subsurface interface elevations was consistent with the line MIP2-1's. The seismic data and the resistivity data agrees with each other well in the first half section. In the last half section, the subsurface interface was suspected as relatively flat/even, as with the resistivity data results. The seismic data was suspected as biased by the overlaying concrete. Note that the low resistivity zone around 140' in the transect was most likely caused by cultural noises.

MIP2-3: The seismic data showed slight rise of the subsurface interface elevation from the first half to the second half of the line. The resistivity data showed this trend more strongly, but probably due to affections from the noises.

MIP2-4: Due to the shallowness of the subsurface interface, the interpreted depth to the subsurface interface are not very accurate; the depth to the subsurface interface along the majority of this line were suspected as about 5 feet or less.

2. Other lines inside the facility

In the 4 lines outside the MIP areas, while the resistivity data still present problems in 3 of them due to electrically resistive overlaying materials or culture noises, the qualities of seismic data were better than those of the MIP areas. It's observed from the data results that the elevation fluctuation of the subsurface interface or interfaces within each line generally was consistent with the ground surface topography. Note that the ground surface topography of each line shown the transects is only consistent within the line itself; the elevations of different lines are not comparable.

Facility-1: The resistivity data and the seismic data agree with each other well. The elevation of the subsurface interface generally went along with the ground surface topography.

Facility-2: According to both the seismic and the resistivity data, there was an interface going along with the ground surface topography. The layer thickness above this interface was from 5' to 10' along the majority of the line. In the resistivity data transect, another interface was shown at the elevation about -20', with less resistive material on the top. The seismic data could not be used to interpret this second interface effectively due to the loose/unconsolidated materials in the top layer, deep depth to the interface, and the limitation of the sledge hammer as the seismic energy source. Similar situations are also found in Line Facility-3 and Line Facility-4.

Facility-3: Similar to Facility-2, the interface from the seismic interpretation generally was consistent with the ground surface topography.

Facility-4: The elevation of the two interfaces appears to be slightly dipping down from the two ends to the middle the line. The resistivity anomalies from 210' to 250' were most likely caused by nearby underground utilities, wells or other metallic structures.

3. Lines outside the facility

In general, the quality of the resistivity data was good, but it's unclear and hard to quantify how much they were affected by possible underground utilities and other 3D features such as ponds and streams. In all areas, the seismic survey was effective to find the first subsurface interfaces, but not for the 2nd interfaces. The top subsurface layers were very soft and absorbed a lot of seismic energies, making the signals far from the energy sources very weak. As a consequence, the seismic refractions from 2nd interfaces (around 50' or deeper as suspected in some lines from the resistivity data) was hard to pick up from the signals.

OF-1: The interface interpreted from the seismic data is relatively flat despite of the surface topography. In the resistivity transect, there is another interface with electrically more resistive materials underneath.

OF-2: The interface was lower at the end of the line, country to the elevated ground surface. The resistivity data and the seismic data roughly agree with each other except at the center of the line around 200' to 280'.

OF-3: The elevation of the interpreted interface from the seismic data appears to be slightly higher in the middle than in the two ends. There are no horizontal interfaces observed from the resistivity data, and it's unclear how much the data was affected by possible nearby underground utilities or other structures. The investigation depth of the resistivity survey was also limited due to the limited spread length.

OF-4: The interface from the seismic interpretation was generally flat and consistent with the ground surface topography, although it appears to be lower in the beginning of the line. At the second half of the resistivity transect, there was another interface visible with more resistive materials underneath. However, there was a pond nearby and it's difficult to quantify how much the resistivity data was affected.

OF-5: The interface from the seismic interpretation generally was consistent with the ground surface topography. For this interface, the resistivity data agrees with the seismic data well in the majority of the line. At the bottom of the resistivity data transect, it's suspected there is a resistive layer, but only with portions visible due to shallow investigation depth.

OF-6: The interpreted interface was consistent with the ground surface topography. The seismic data and the resistivity data agree with each other very well.

OF-7: The interpreted interface was consistent with the ground surface topography. The seismic data and the resistivity data agree with each other well. There was possibly another interface visible at about 470' ~ 530' in the resistivity transect.

OF-8: From 120' to 200', the 2nd interface was visible in the resistivity transect. This line crossed a metallic fence which was almost parallel to the line. Certain affections on the resistivity data are expected.

OF-9: The majority of the 2nd interface was visible in the resistivity data. From 410' to 780', the interface should be relatively smooth with higher elevations at the end of the line. The interface was blurred there in the resistivity data because the top layers were also electrically resistive.

OF-10: From about 640' to 1000', the 2nd interface are vaguely visible at the bottom of the resistivity transect and it should be relatively smooth.

OF-11: From about 120' to 300', the 2nd interface is suspected as right below or even in the bottom of resistivity transect. The 2nd interface was partially visible in the second section of the resistivity transect.

OF-12: From about 1050' to 1750', the 2nd interface was partially visible at the bottom of the resistivity transect.

OF-13: Along the resistivity profile, the investigation depths of the some portions were limited due to the limited spread lengths. Except some small portions, the 2nd interface was not visible in the resistivity transect.

4.0 LIMITATIONS

The reinforced concrete, underground utilities, fences and other metallic structures along some lines could negatively affected the resistivity data significantly and their affection on the data could not be quantified without their detailed information. Even with details known, their complexity could pose serious challenge on data processing and interpretation. Also, due to electrically resistive overlaying materials along some lines, the interfaces are not distinct in the resistivity transects.

The electrical resistivity inverted from the data is generally not representative of the true electrical resistivity. In fact, they can be far away from the true resistivity. The value of the inverted resistivity transects lies mainly in the electrical resistivity contrasts/variations within the transects. The depths of the 2nd interfaces from the resistivity data are interpreted without any references of known depths; they should be adjusted accordingly once the references are available.

The concrete along some lines made the seismic refraction survey impossible or difficult. The loose overlaying materials along some lines also negatively affect the efficiency of seismic data acquisition, the data quality and investigation depth. The seismic data quality was also negatively affected by wind, rain and traffic, etc, although in a less extent.

Some lines were divided into sections due to obstacles such as buildings, railroads, and roads, etc. The investigation depths, especially of the resistivity survey, were affected for some very short sections.

As in all geophysical surveys, there are noises in the data. The geophysical interpretation results were also affected by the 3D nature and non-uniqueness.

5.0 WARRANTIES

The field observations and measurements reported herein are considered sufficient in detail and scope for this project. Enviroprobe Service, Inc. warrants that the findings and conclusions contained herein have been promulgated in accordance with generally accepted environmental engineering methods. There is a possibility that conditions may exist which could not be identified within the scope of this project and were not apparent during the site activities performed for this project.

Enviroprobe represents that the services were performed in a manner consistent with that level of care and skill ordinarily exercised by environmental consultants under similar circumstances. No other representations to Client, express or implied, and no warranty or guarantee is included or intended in this agreement, or in any report, document, or otherwise.

Enviroprobe Service, Inc. believes that the information provided in this report is reliable. However, Enviroprobe cannot warrant or guarantee that the information provided by others is complete or accurate. No other warranties or guarantees are implied or expressed.

This report was prepared pursuant to the contract Enviroprobe has with the Client. That contractual relationship included an exchange of information about the property that was unique and between Enviroprobe and its client and serves as the basis upon which this report was prepared. Because of the importance of the communication between Enviroprobe and its client, reliance or any use of this report by anyone other than the Client, for whom it was prepared, is prohibited and therefore not foreseeable to Enviroprobe.

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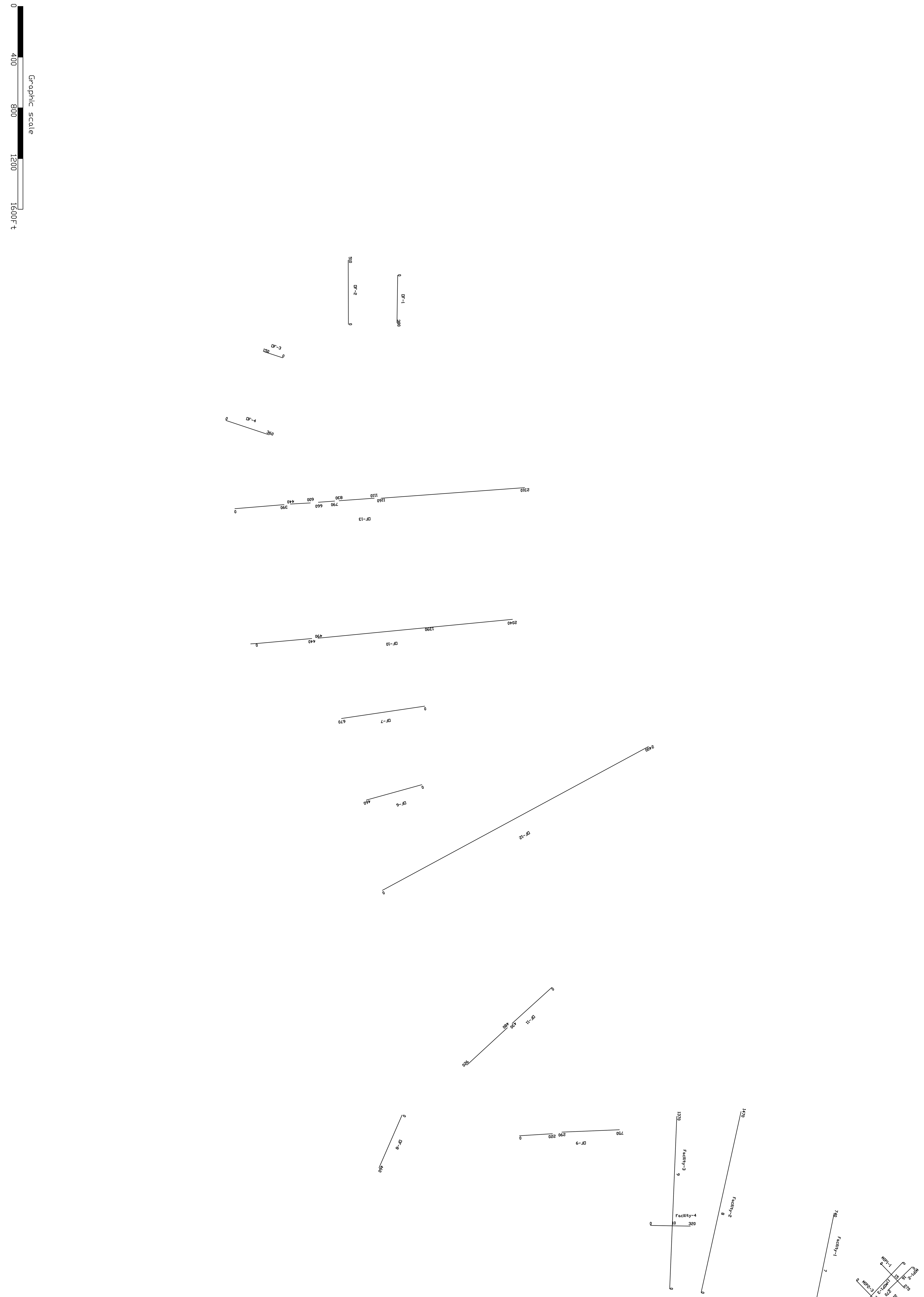
Line/velocity(ft/s)	layer 1	layer 2
MIP1-2	1742	7826
MIP1-3	1648	8560
MIP2-1	2536	8691
MIP2-2	4490	7036
MIP2-3	1553	11594
MIP2-4	2950	8429
Facility-1	1581	7752
Facility-2	1765	5296
Facility-3	1639	6163
Facility-4	1339	6313
OF-1	2224	7011
OF-2	2374	5979
OF-3	1509	6969
OF-4	1600	5907
OF-5	1657	7259
OF-6	1300	6143
OF-7	1659	6004
OF-8	1971	9844
OF-9 1	1528	6202
OF-9 2	1258	5800
OF-10 (Section 1)	1473	5838
OF-10 (Section 2)	1562	6539
OF-11 1	1438	5731
OF-11 2	1337	6387
OF-12 (Section 1)	1534	6613
OF-12 (Section 2)	1351	6757
OF-13 (Section 1)	1805	5806
OF-13 (Section 2)	1392	6495
OF-13 (Section 3)	1223	7023
OF-13 (Section 4)	1748	12038
OF-13 (Section 5)	1871	7880

Table 1. Seismic P wave velocities in the survey survey area. Layer 1 and 2 are the layer

above and below the subsurface interface from the seismic data interpretation, respectively.



This site plan was produced from data positioned by differential GPS measurements collected in the field. Due to the errors normally present in DGPS data, this document is not intended or represented to be of survey precision. Caution should be used in all field measurements based on this site plan.

As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity of any anomalies indicated in this document The absence of detected signatures does not preclude the possibility that targets exist. The geophysical data and results presented in this site plan are based upon the application of scientific principles and professional judgements to certain facts with resultant subjective interpretations. Professional judgements expressed herein are based on the facts currently available within the limits of the existing data, scope of work, budget, and schedule.

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SW101101
SHEET NO.
2 of 2

GEOPHYSICAL INVESTIGATION
POSITIONS OF GEOPHYSICAL SURVEY LINES
FOR
TETRA TECH

ENVIROPROBE SERVICE INC.
908 N Lenola Rd, Moorestown, NJ 08057
Phone: (800) 596-7472 Fax: (856) 858-7172

DATE	DESCRIPTION	REV.
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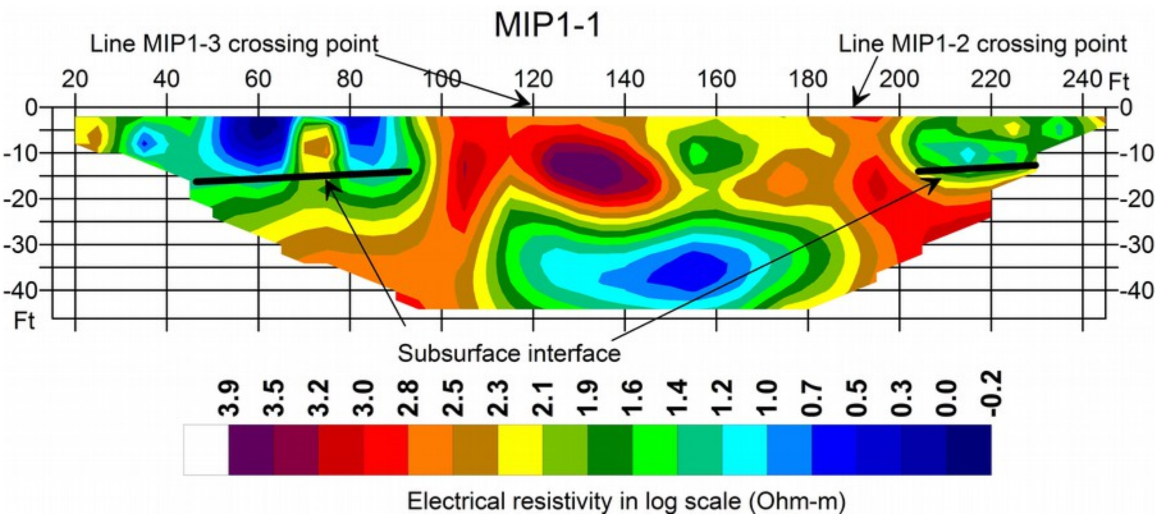
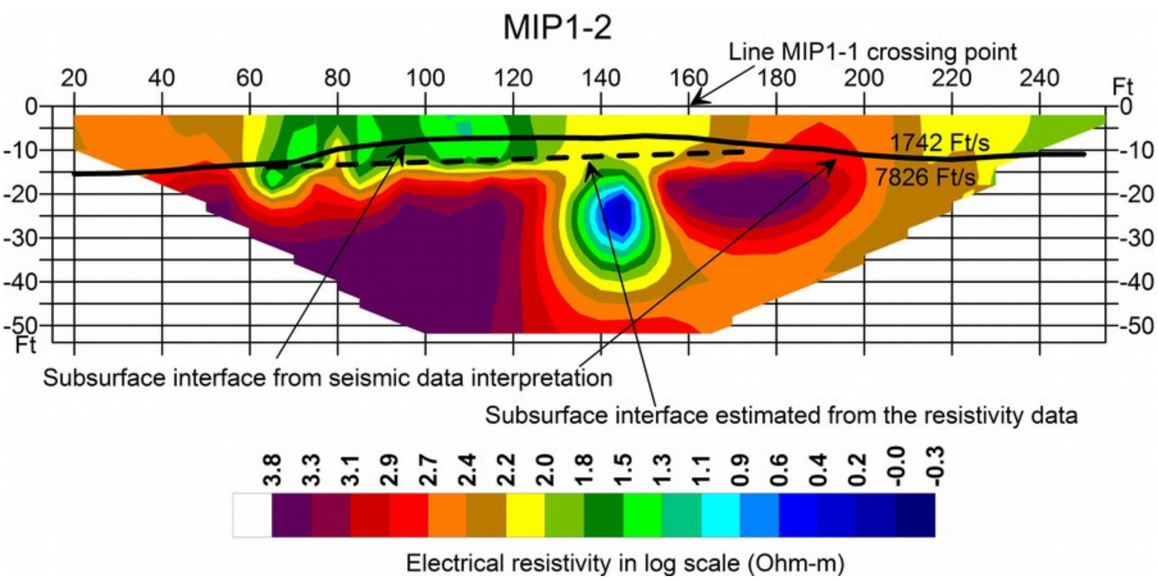
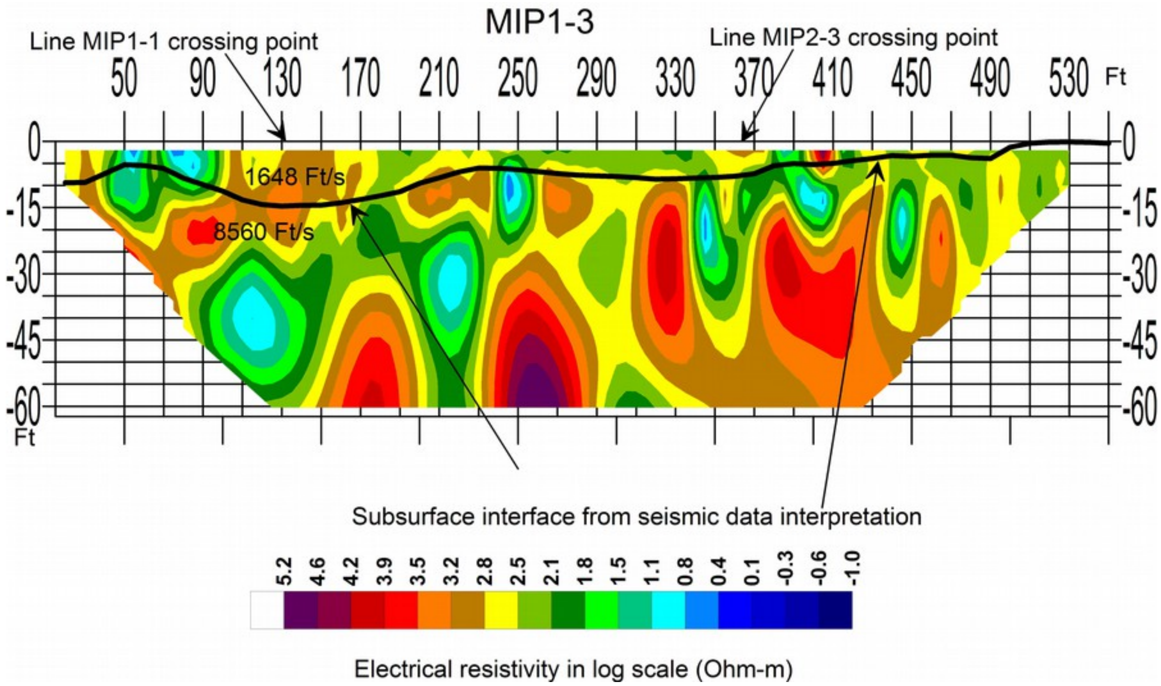
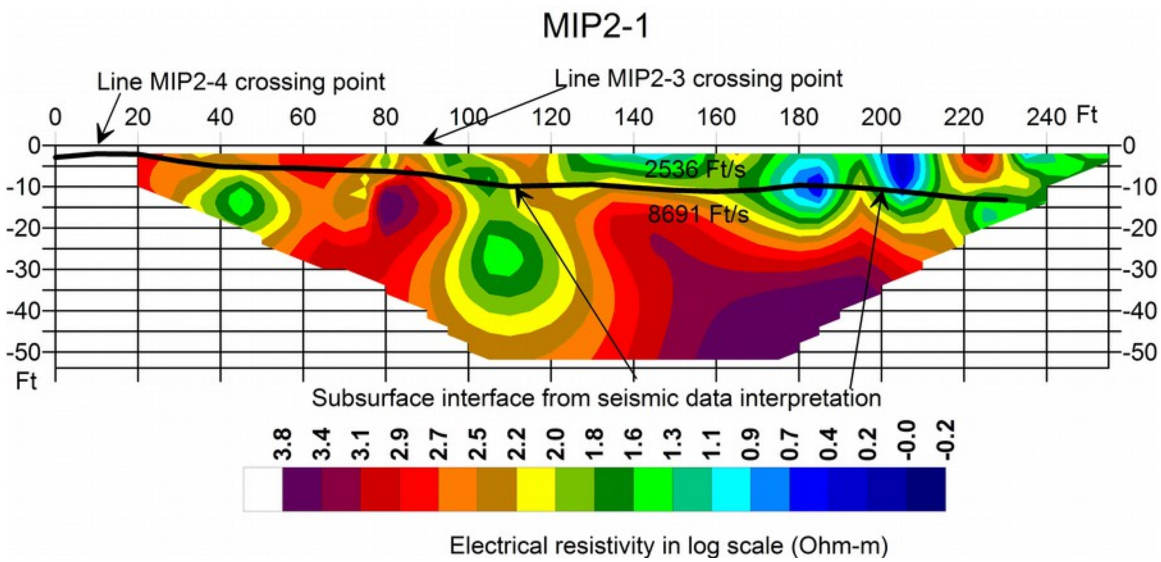
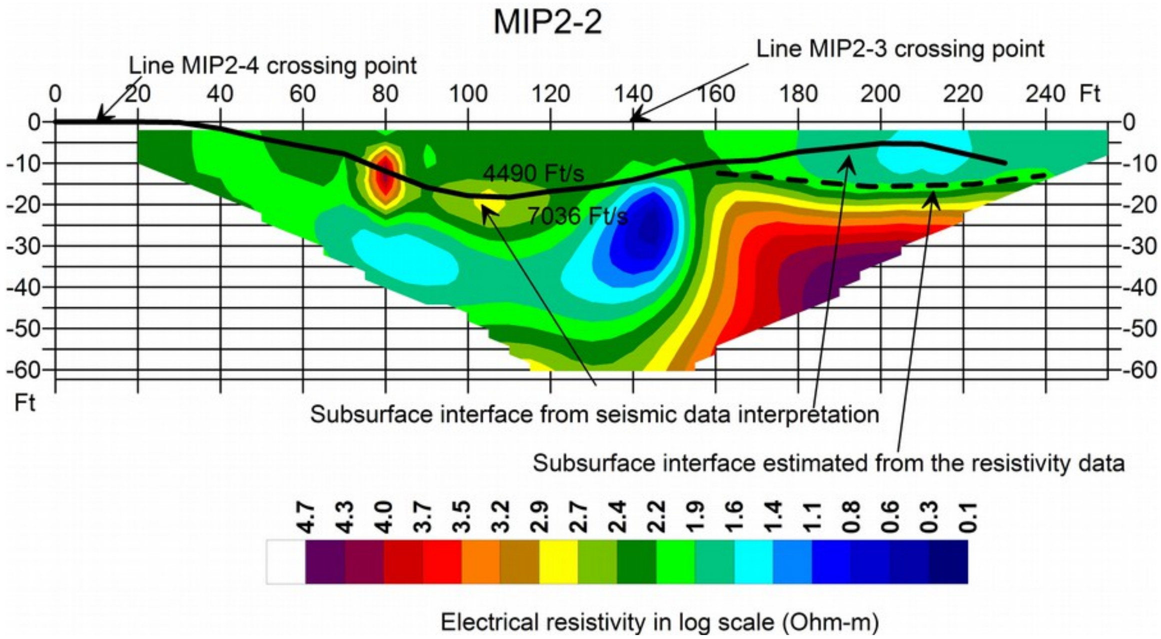
REVISIONS

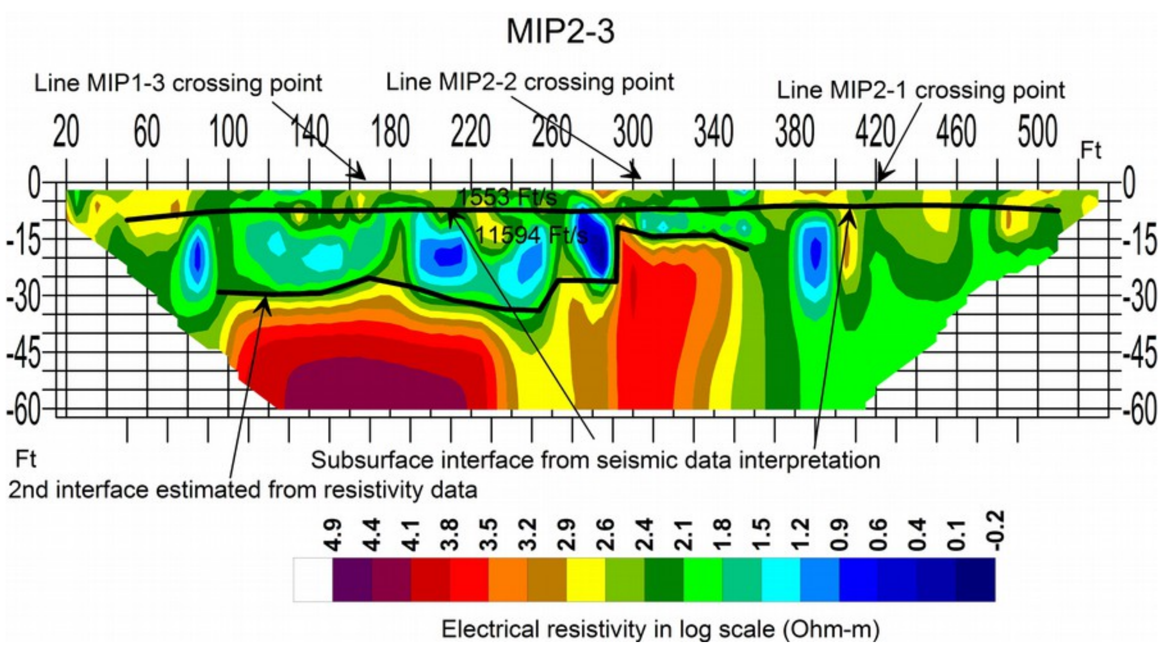

MIP1-1
Line MIP1-3 crossing point
Line MIP1-2 crossing point
20 40 60 80 100 120 140 160 180 200 220 240 Ft
0 -10 -20 -30 -40 Ft
Subsurface interface
3.9 3.5 3.2 3.0 2.8 2.5 2.3 2.1 1.9 1.6 1.4 1.2 1.0 0.7 0.5 0.3 0.0 -0.2
Electrical resistivity in log scale (Ohm-m)

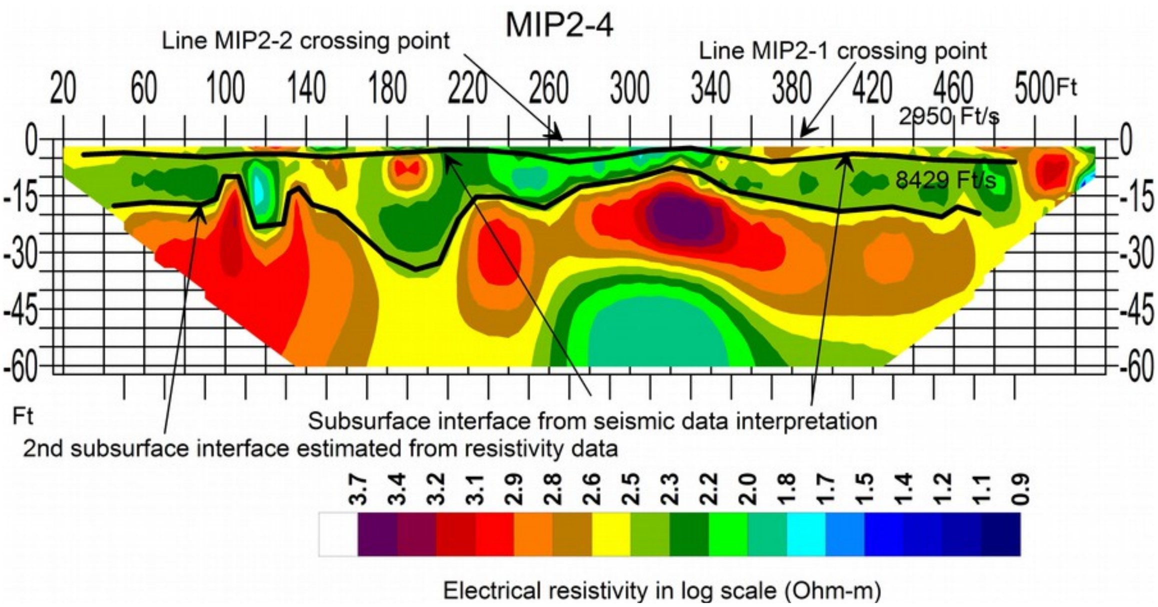

MIP1-2
Line MIP1-1 crossing point
20 40 60 80 100 120 140 160 180 200 220 240 Ft
0 -10 -20 -30 -40 -50 Ft
1742 Ft/s
7826 Ft/s
Subsurface interface from seismic data interpretation
Subsurface interface estimated from the resistivity data
3.8 3.3 3.1 2.9 2.7 2.4 2.2 2.0 1.8 1.5 1.3 1.1 0.9 0.6 0.4 0.2 -0.0 -0.3
Electrical resistivity in log scale (Ohm-m)

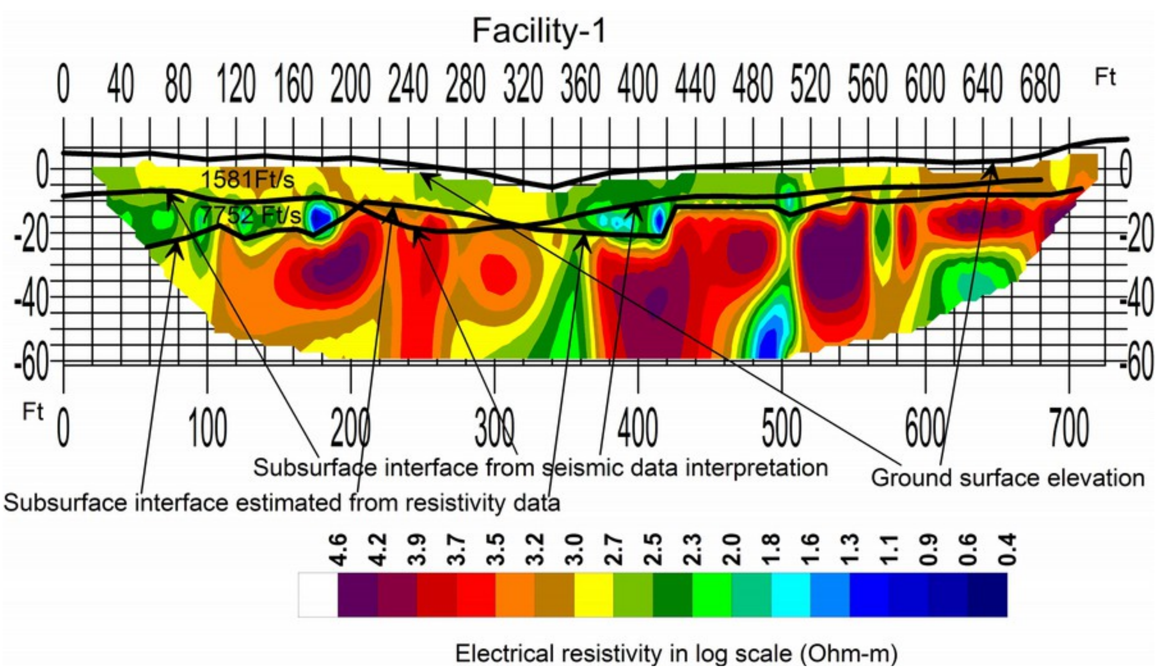

MIP1-3
Line MIP1-1 crossing point
Line MIP2-3 crossing point
50 90 130 170 210 250 290 330 370 410 450 490 530 Ft
0
-15
-30
-45
-60
Ft
1648 Ft/s
8560 Ft/s
Subsurface interface from seismic data interpretation
5.2 4.6 4.2 3.9 3.5 3.2 2.8 2.5 2.1 1.8 1.5 1.1 0.8 0.4 0.1 -0.3 -0.6 -1.0
Electrical resistivity in log scale (Ohm-m)

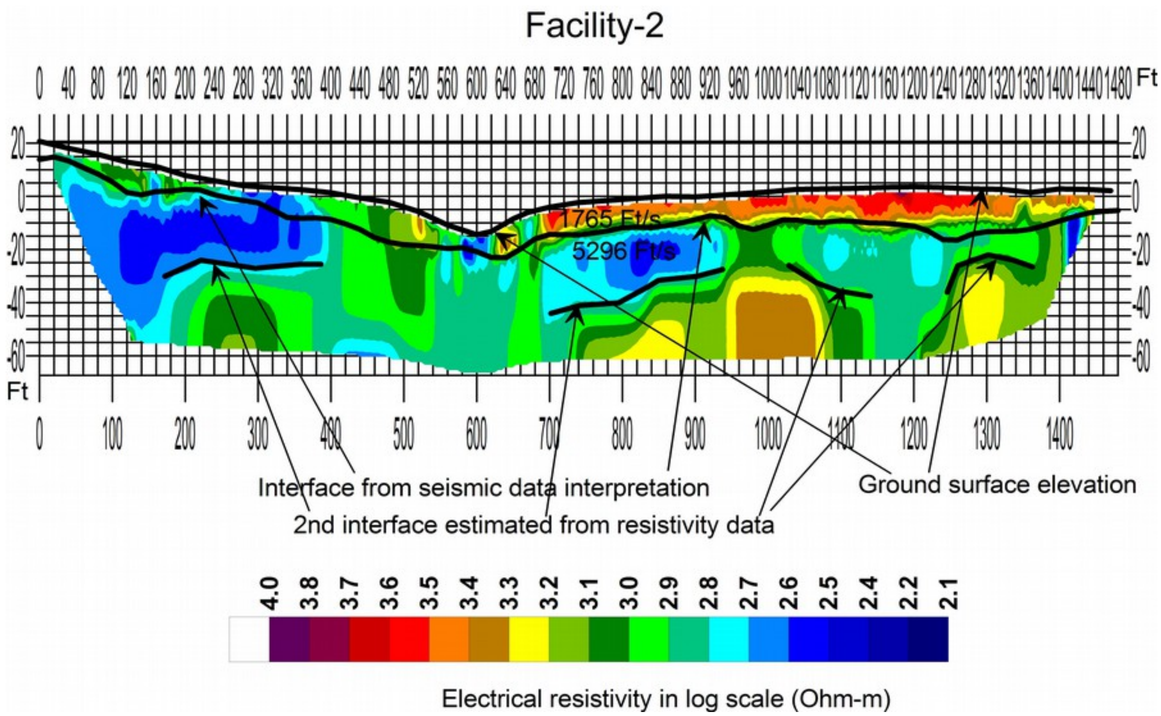

MIP2-1
Line MIP2-4 crossing point
Line MIP2-3 crossing point
0 20 40 60 80 100 120 140 160 180 200 220 240 Ft
0
-10
-20
-30
-40
-50
Ft
2536 Ft/s
8691 Ft/s
Subsurface interface from seismic data interpretation
3.8 3.4 3.1 2.9 2.7 2.5 2.2 2.0 1.8 1.6 1.3 1.1 0.9 0.7 0.4 0.2 -0.0 -0.2
Electrical resistivity in log scale (Ohm-m)

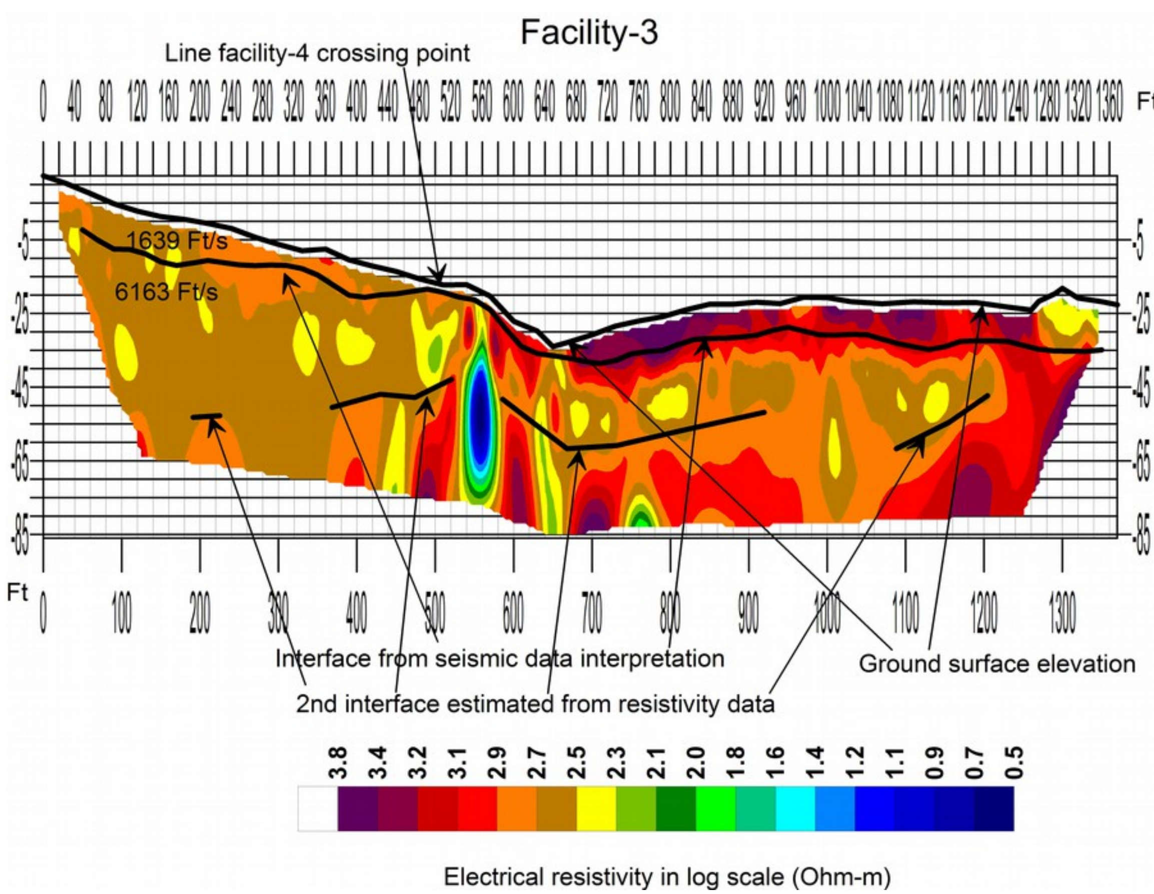

MIP2-2
Line MIP2-4 crossing point
Line MIP2-3 crossing point
0 20 40 60 80 100 120 140 160 180 200 220 240 Ft
0 -10 -20 -30 -40 -50 -60
Ft
4490 Ft/s
7036 Ft/s
Subsurface interface from seismic data interpretation
Subsurface interface estimated from the resistivity data
4.7 4.3 4.0 3.7 3.5 3.2 2.9 2.7 2.4 2.2 1.9 1.6 1.4 1.1 0.8 0.6 0.3 0.1
Electrical resistivity in log scale (Ohm-m)

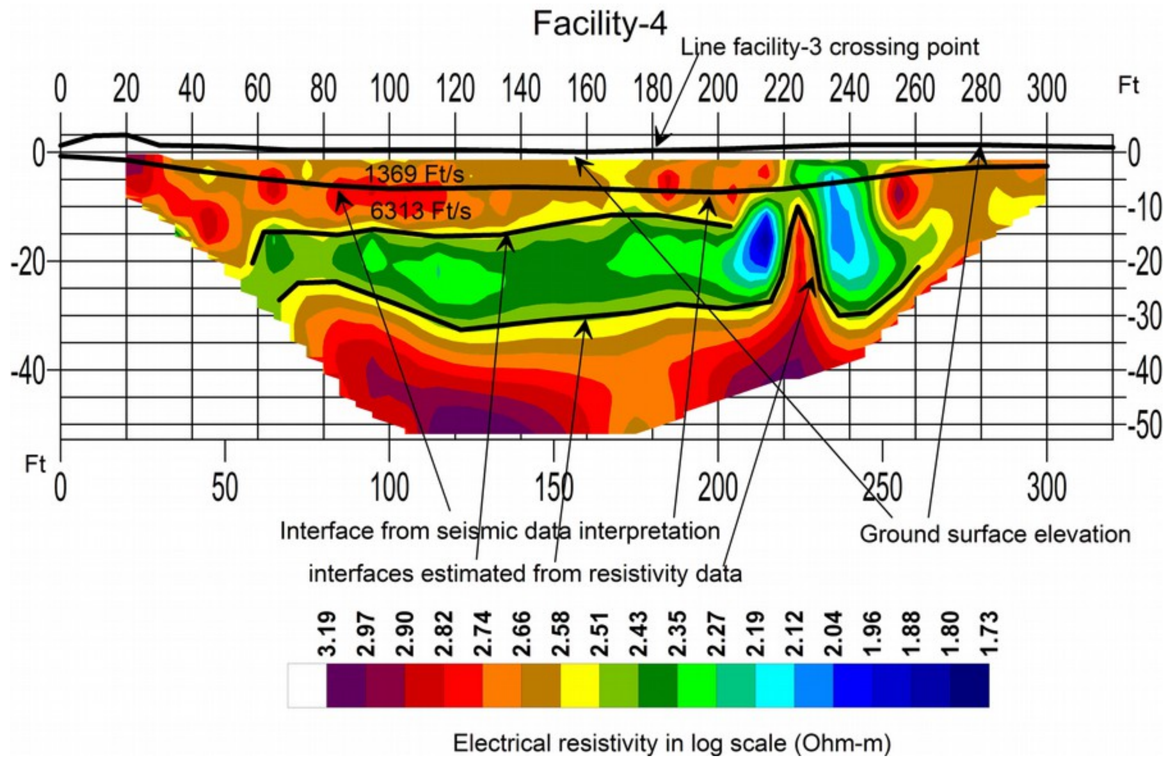

MIP2-3
Line MIP1-3 crossing point
Line MIP2-2 crossing point
Line MIP2-1 crossing point
20 60 100 140 180 220 260 300 340 380 420 460 500 Ft
0 -15 -30 -45 -60
Ft
1553 Ft/s
11594 Ft/s
Subsurface interface from seismic data interpretation
2nd interface estimated from resistivity data
4.9 4.4 4.1 3.8 3.5 3.2 2.9 2.6 2.4 2.1 1.8 1.5 1.2 0.9 0.6 0.4 0.1 -0.2
Electrical resistivity in log scale (Ohm-m)

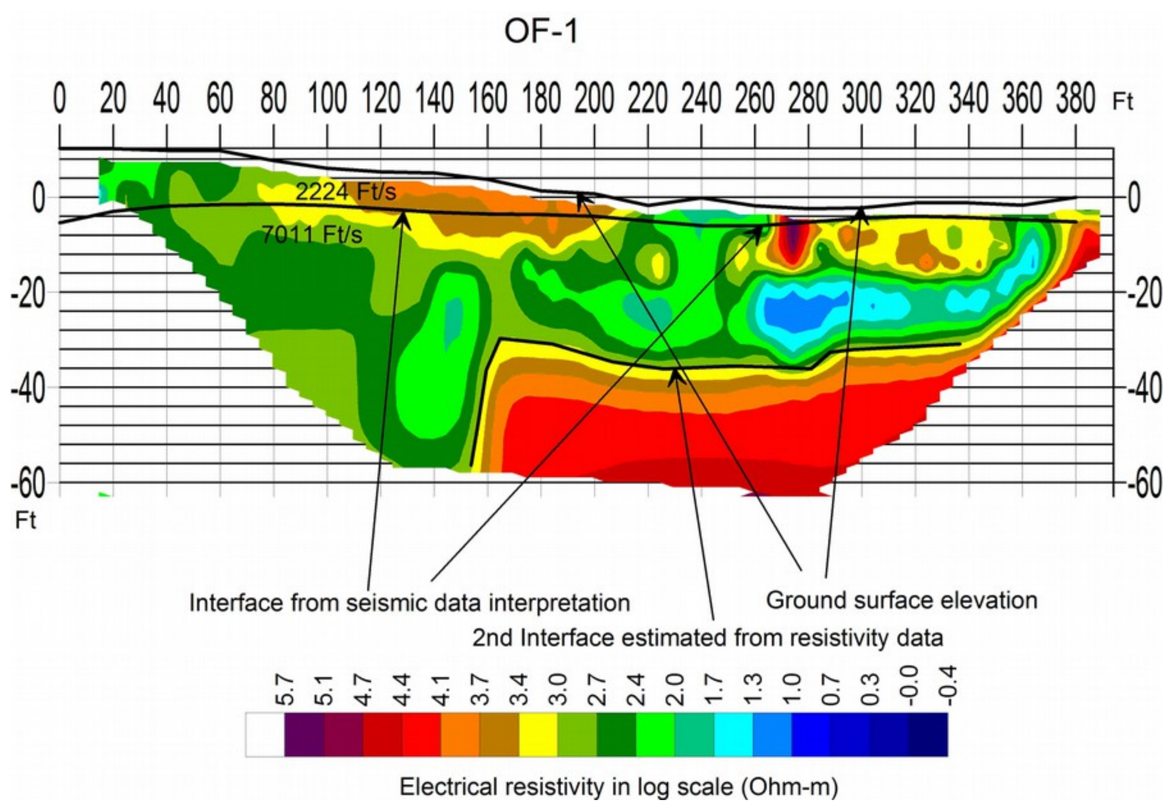

MIP2-4
Line MIP2-2 crossing point
Line MIP2-1 crossing point
2950 Ft/s
8429 Ft/s
Subsurface interface from seismic data interpretation
2nd subsurface interface estimated from resistivity data
Electrical resistivity in log scale (Ohm-m)

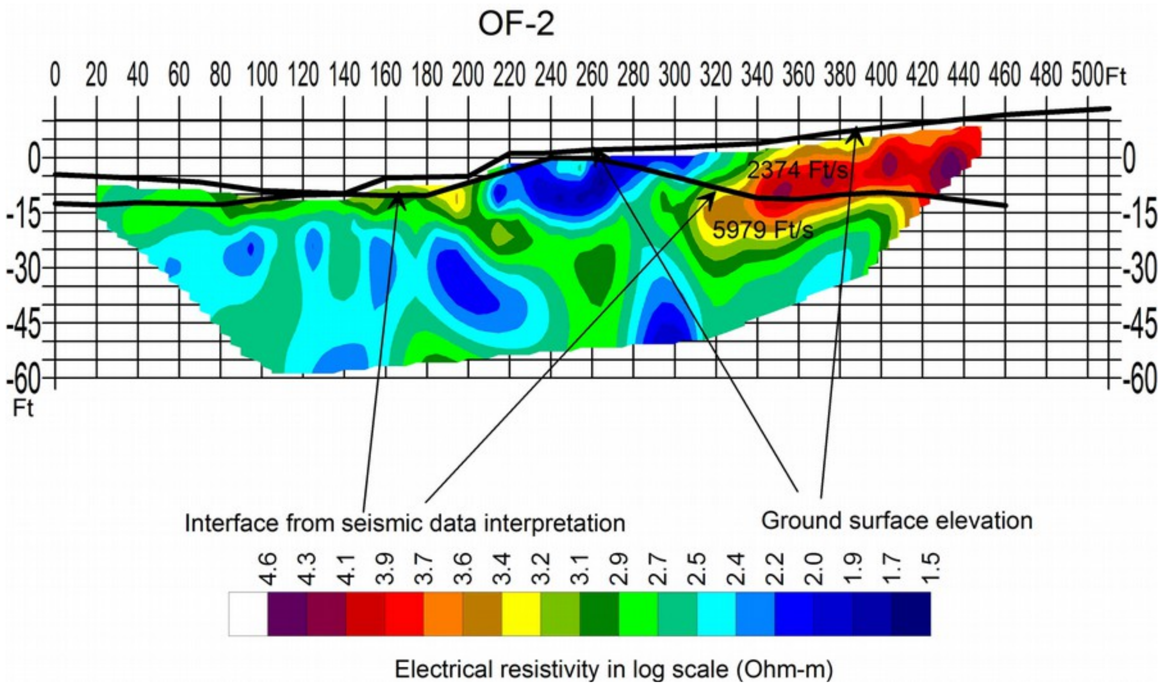

Facility-1
1581Ft/s
7752 Ft/s
Subsurface interface from seismic data interpretation
Ground surface elevation
Subsurface interface estimated from resistivity data
Electrical resistivity in log scale (Ohm-m)

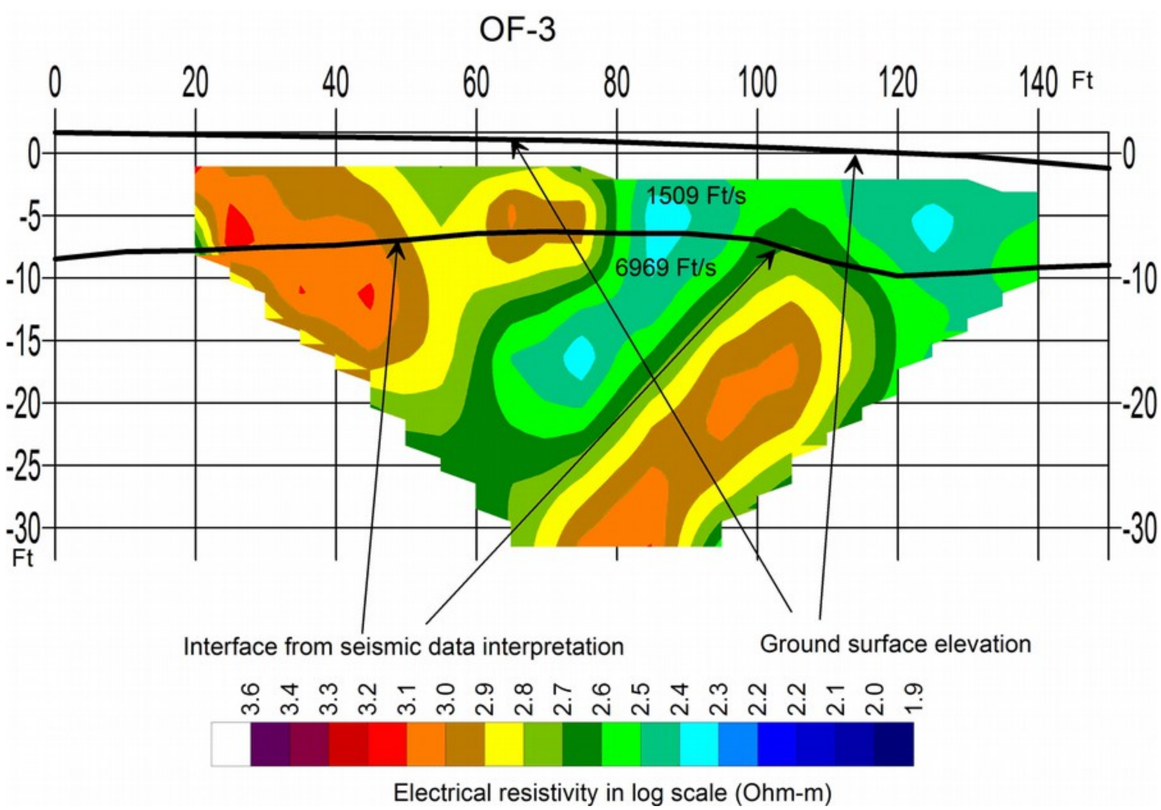

Facility-2
0 40 80 120 160 200 240 280 320 360 400 440 480 520 560 600 640 680 720 760 800 840 880 920 960 1000 1040 1080 1120 1160 1200 1240 1280 1320 1360 1400 1440 1480 Ft
20
0
-20
-40
-60
Ft
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400
1765 Ft/s
5296 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd interface estimated from resistivity data
4.0 3.8 3.7 3.6 3.5 3.4 3.3 3.2 3.1 3.0 2.9 2.8 2.7 2.6 2.5 2.4 2.2 2.1
Electrical resistivity in log scale (Ohm-m)

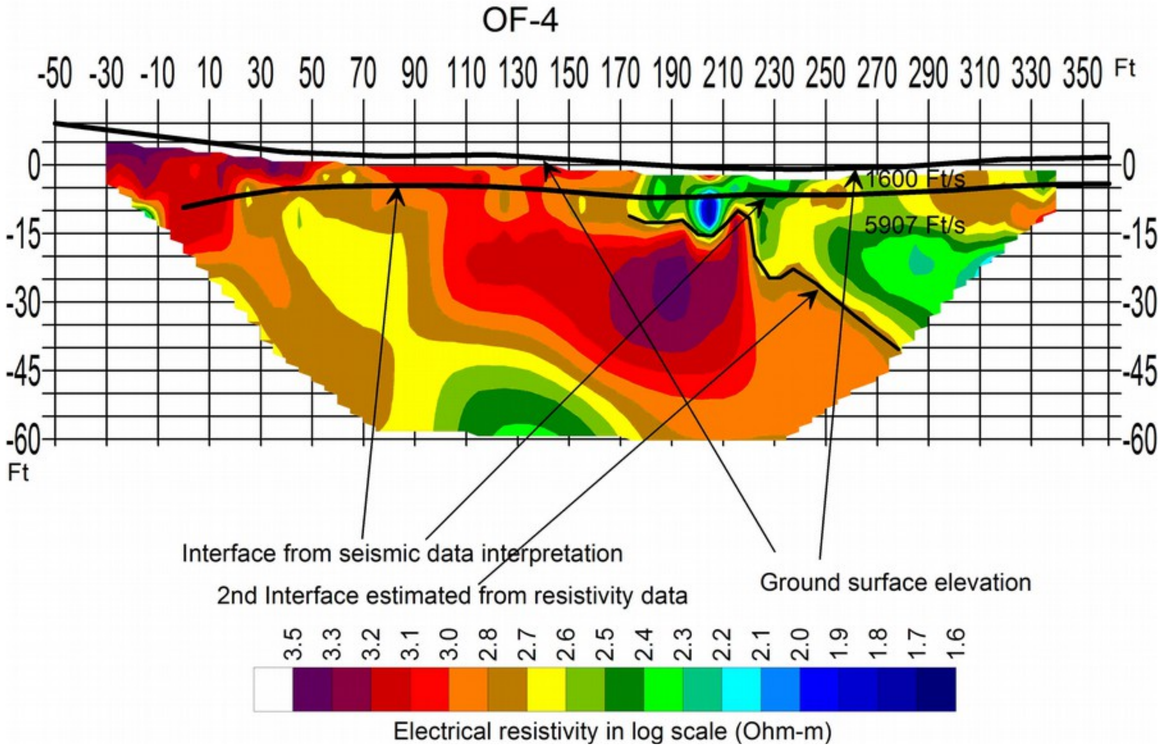

Facility-3
Line facility-4 crossing point
0 40 80 120 160 200 240 280 320 360 400 440 480 520 560 600 640 680 720 760 800 840 880 920 960 1000 1040 1080 1120 1160 1200 1240 1280 1320 1360 Ft
-5
-25
-45
-65
-85
Ft
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300
1639 Ft/s
6163 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd interface estimated from resistivity data
3.8 3.4 3.2 3.1 2.9 2.7 2.5 2.3 2.1 2.0 1.8 1.6 1.4 1.2 1.1 0.9 0.7 0.5
Electrical resistivity in log scale (Ohm-m)

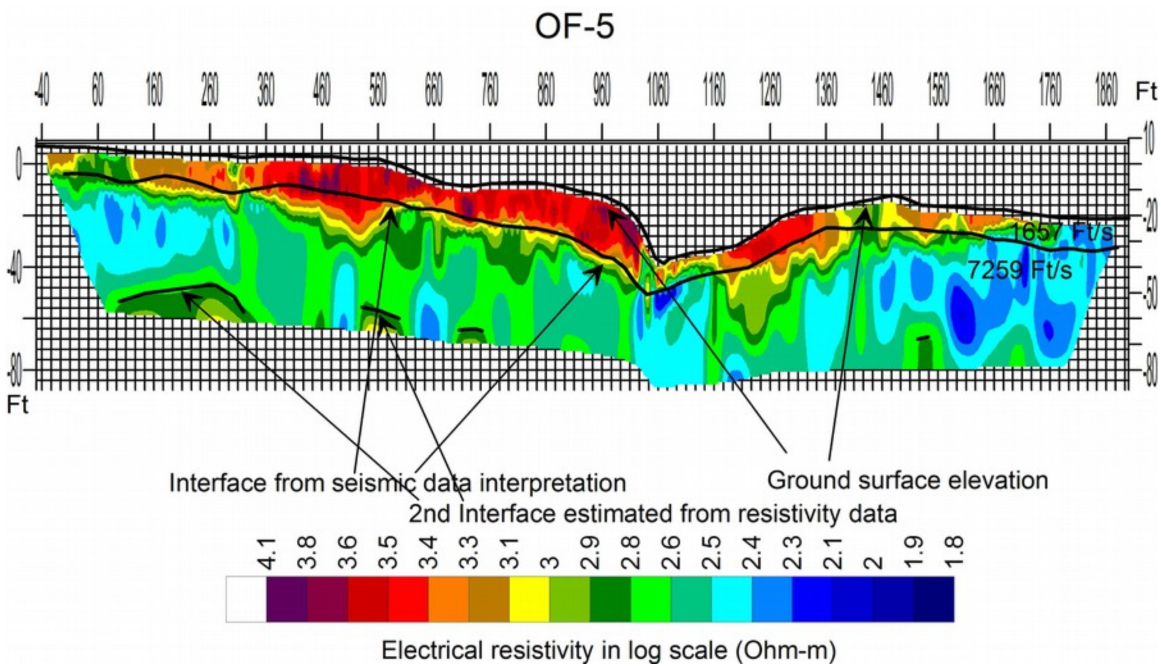

Facility-4
Line facility-3 crossing point
1369 Ft/s
6313 Ft/s
Interface from seismic data interpretation
Ground surface elevation
interfaces estimated from resistivity data
3.19 2.97 2.90 2.82 2.74 2.66 2.58 2.51 2.43 2.35 2.27 2.19 2.12 2.04 1.96 1.88 1.80 1.73
Electrical resistivity in log scale (Ohm-m)

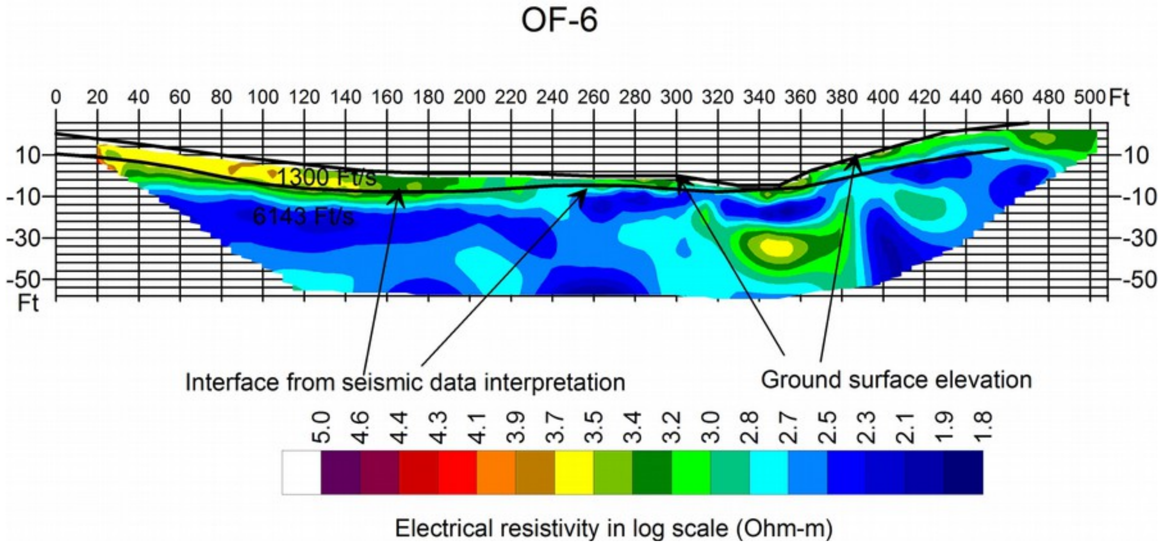

OF-1
2224 Ft/s
7011 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
5.7 5.1 4.7 4.4 4.1 3.7 3.4 3.0 2.7 2.4 2.0 1.7 1.3 1.0 0.7 0.3 -0.0 -0.4
Electrical resistivity in log scale (Ohm-m)

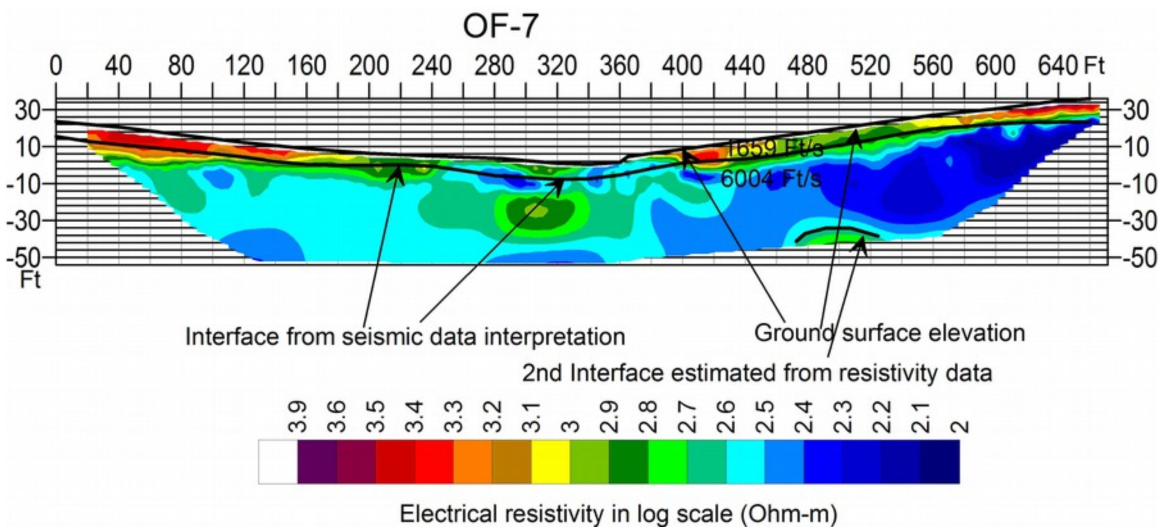

OF-2
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 Ft
0
-15
-30
-45
-60
Ft
2374 Ft/s
5979 Ft/s
Interface from seismic data interpretation
Ground surface elevation
4.6 4.3 4.1 3.9 3.7 3.6 3.4 3.2 3.1 2.9 2.7 2.5 2.4 2.2 2.0 1.9 1.7 1.5
Electrical resistivity in log scale (Ohm-m)

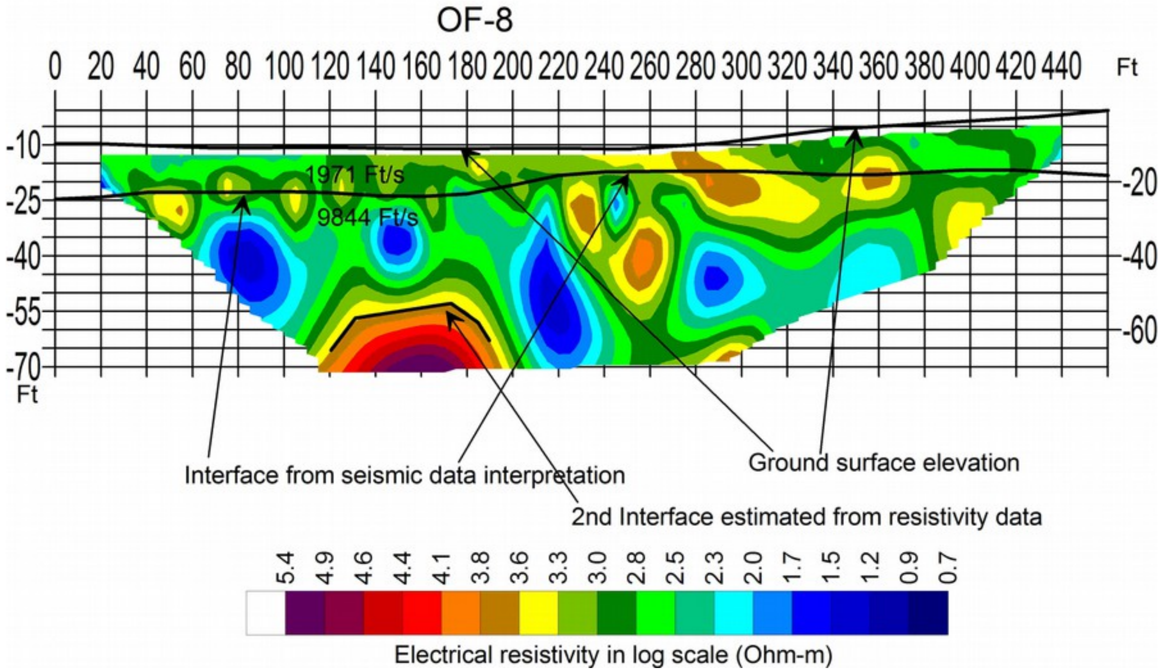

OF-3
0 20 40 60 80 100 120 140 Ft
0
-5
-10
-15
-20
-25
-30
Ft
1509 Ft/s
6969 Ft/s
Interface from seismic data interpretation
Ground surface elevation
3.6 3.4 3.3 3.2 3.1 3.0 2.9 2.8 2.7 2.6 2.5 2.4 2.3 2.2 2.2 2.1 2.0 1.9
Electrical resistivity in log scale (Ohm-m)

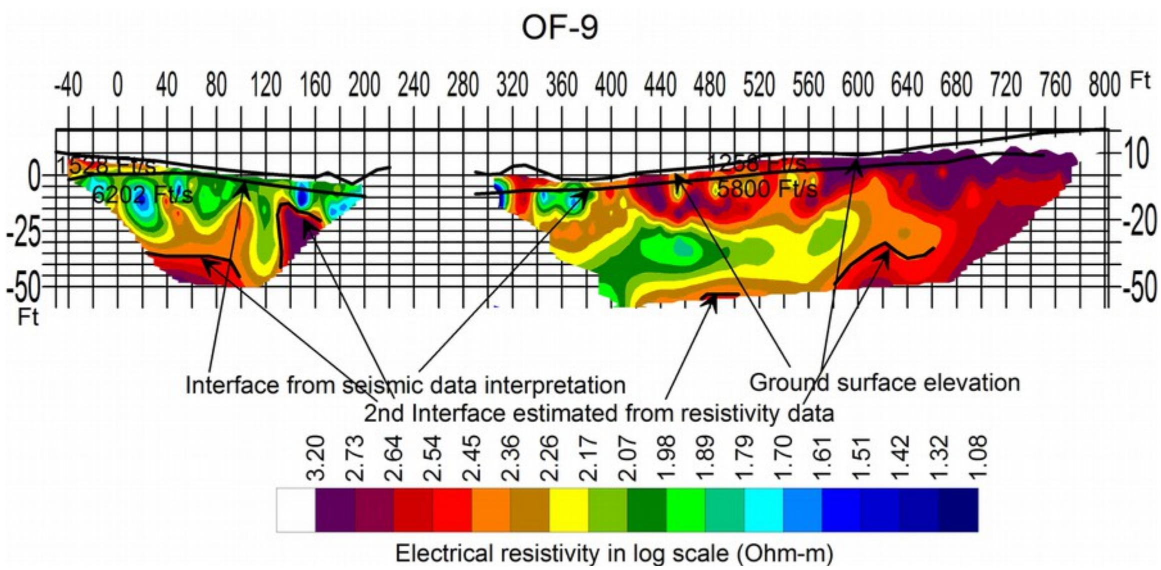

OF-4
-50 -30 -10 10 30 50 70 90 110 130 150 170 190 210 230 250 270 290 310 330 350 Ft
0
-15
-30
-45
-60
Ft
1600 Ft/s
5907 Ft/s
Interface from seismic data interpretation
2nd Interface estimated from resistivity data
Ground surface elevation
3.5 3.3 3.2 3.1 3.0 2.8 2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6
Electrical resistivity in log scale (Ohm-m)

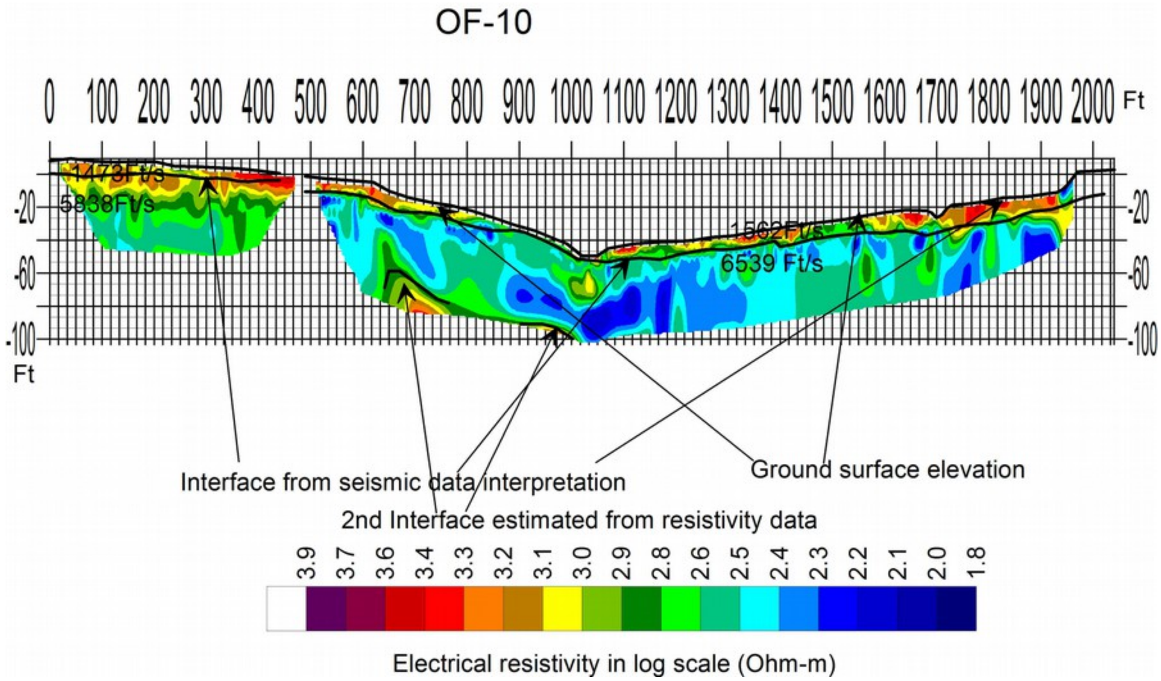

OF-5
-40 60 160 260 360 460 560 660 760 860 960 1060 1160 1260 1360 1460 1560 1660 1760 1860 Ft
0
-40
-80
Ft
10
-20
-50
-80
1657 Ft/s
7259 Ft/s
Interface from seismic data interpretation
2nd Interface estimated from resistivity data
Ground surface elevation
4.1 3.8 3.6 3.5 3.4 3.3 3.1 3 2.9 2.8 2.6 2.5 2.4 2.3 2.1 2 1.9 1.8
Electrical resistivity in log scale (Ohm-m)

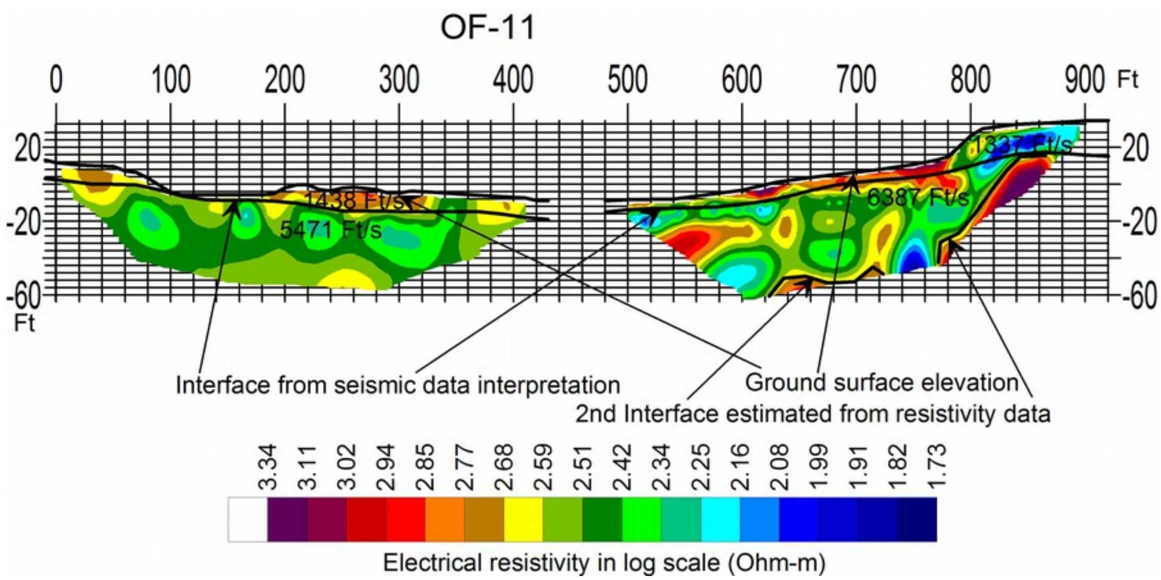

OF-6
1300 Ft/s
6143 Ft/s
Interface from seismic data interpretation
Ground surface elevation
Electrical resistivity in log scale (Ohm-m)

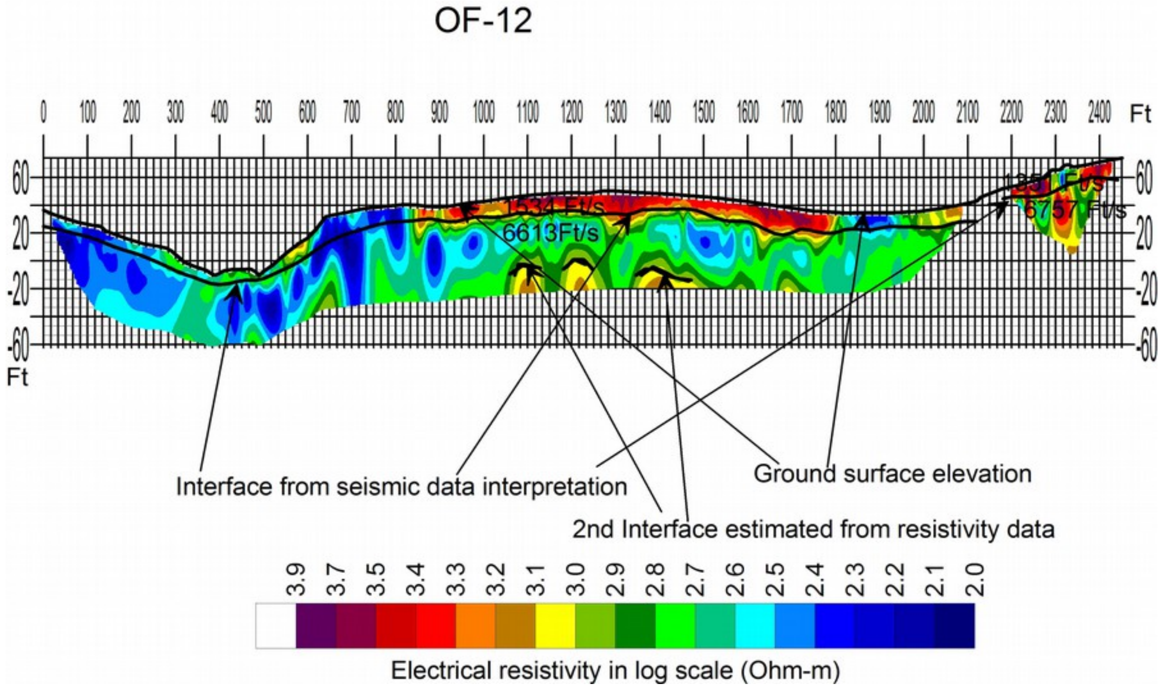

OF-7
1659 Ft/s
6004 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
Electrical resistivity in log scale (Ohm-m)

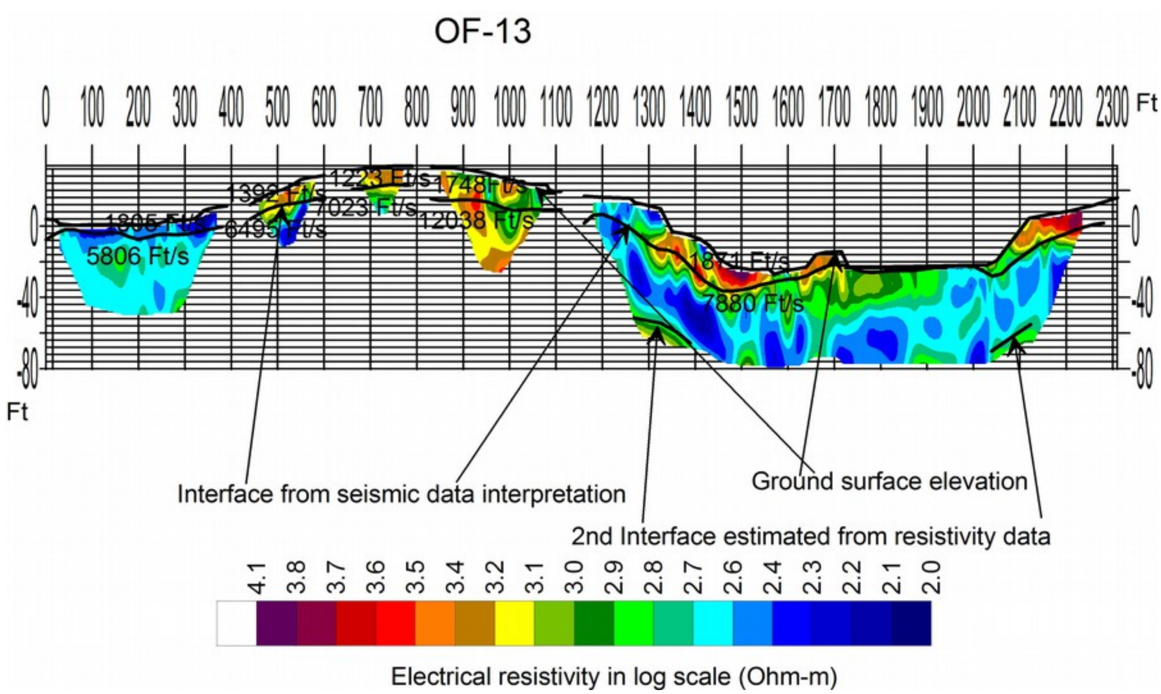

OF-8
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 Ft
-10
-25
-40
-55
-70
Ft
-20
-40
-60
1971 Ft/s
9844 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
5.4 4.9 4.6 4.4 4.1 3.8 3.6 3.3 3.0 2.8 2.5 2.3 2.0 1.7 1.5 1.2 0.9 0.7
Electrical resistivity in log scale (Ohm-m)

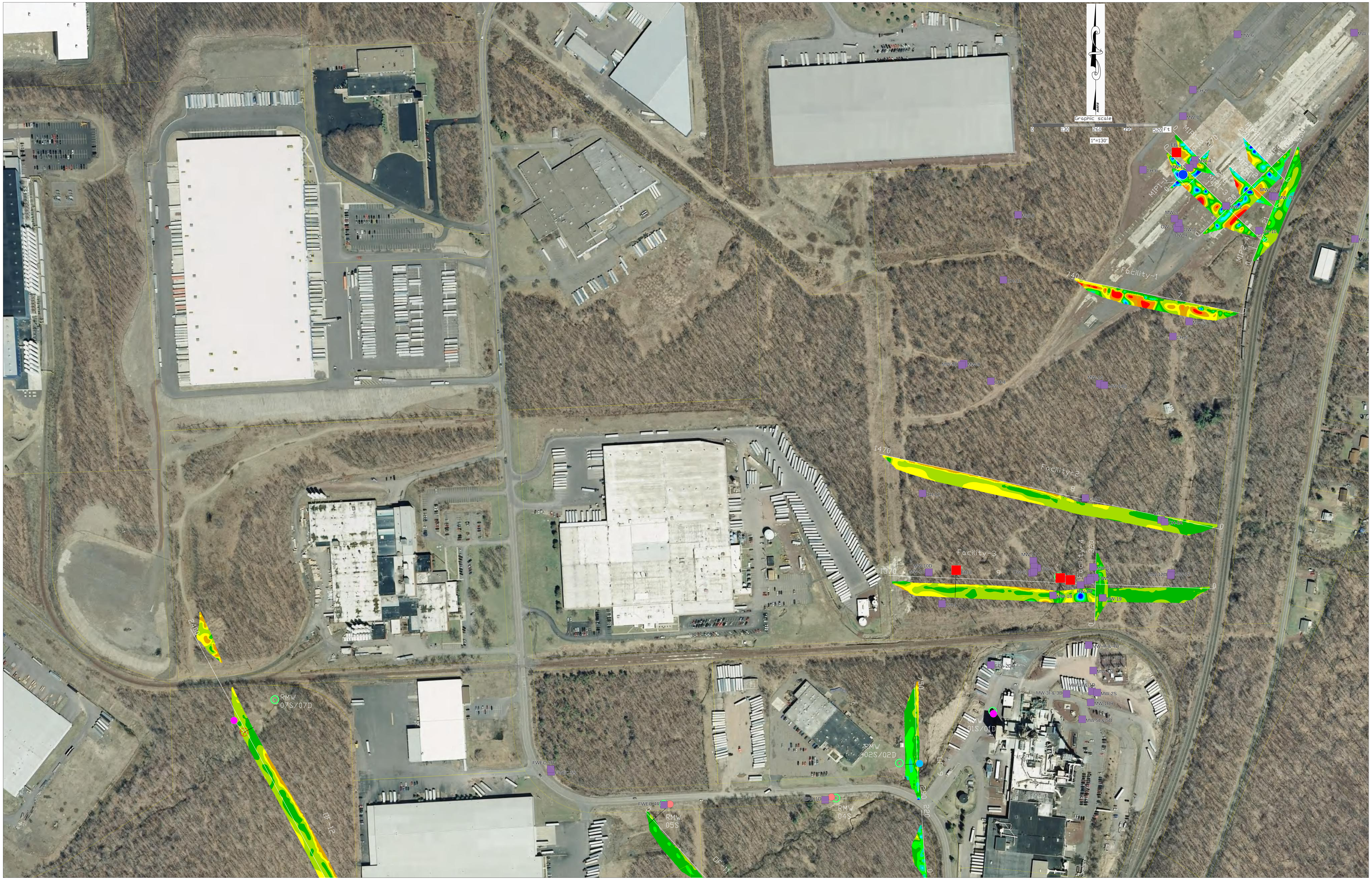

OF-9
-40 0 40 80 120 160 200 240 280 320 360 400 440 480 520 560 600 640 680 720 760 800 Ft
0
-25
-50
Ft
10
-20
-50
1528 Ft/s
6202 Ft/s
1258 Ft/s
5800 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
3.20 2.73 2.64 2.54 2.45 2.36 2.26 2.17 2.07 1.98 1.89 1.79 1.70 1.61 1.51 1.42 1.32 1.08
Electrical resistivity in log scale (Ohm-m)


OF-10
0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 Ft
-20
-60
-100
Ft
1473Ft/s
5838Ft/s
1562Ft/s
6539 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
3.9 3.7 3.6 3.4 3.3 3.2 3.1 3.0 2.9 2.8 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.8
Electrical resistivity in log scale (Ohm-m)


OF-11
0 100 200 300 400 500 600 700 800 900 Ft
20
-20
-60
Ft
1438 Ft/s
5471 Ft/s
1337 Ft/s
6387 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
3.34 3.11 3.02 2.94 2.85 2.77 2.68 2.59 2.51 2.42 2.34 2.25 2.16 2.08 1.99 1.91 1.82 1.73
Electrical resistivity in log scale (Ohm-m)


OF-12
Ft
Ft
1534 Ft/s
6613Ft/s
1351 Ft/s
5757 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
3.9 3.7 3.5 3.4 3.3 3.2 3.1 3.0 2.9 2.8 2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0
Electrical resistivity in log scale (Ohm-m)


OF-13
Ft
Ft
1805 Ft/s
5806 Ft/s
1398 Ft/s
6495 Ft/s
1223 Ft/s
7023 Ft/s
1748 Ft/s
12038 Ft/s
1871 Ft/s
7880 Ft/s
Interface from seismic data interpretation
Ground surface elevation
2nd Interface estimated from resistivity data
4.1 3.8 3.7 3.6 3.5 3.4 3.2 3.1 3.0 2.9 2.8 2.7 2.6 2.4 2.3 2.2 2.1 2.0
Electrical resistivity in log scale (Ohm-m)



5.1	4.7	4.4	4.1	3.7	3.4	3.0	2.7	2.4	2.0	1.7	1.3	1.0	0.7	0.3	0.0

Electrical resistivity in log scale (Ohm-m)

Legend:

- Field Verified Proposed Well Locations
- Revised Proposed Well Locations
- Original Proposed RI Overburden/Bedrock Monitoring Well Cluster w/Rock Coring
- Original Proposed RI Overburden Monitoring Well
- Existing Monitoring Well
- Original Proposed RI Overburden/Bedrock Monitoring Well Cluster
- Original Proposed RI Bedrock Monitoring Well w/Rock Coring
- Exploratory Boring Location
- Matrix Diffusion Location

TETRA TECH INC.
1000 THE AMERICAN ROAD
MORRIS PLAINS, NJ 07950
(973) 630-8000

REV	DESCRIPTION	PREP'D	DSIGN'D	CHK'D	APRV'D	DATE
1	Preliminary edits	VJA	VJA			3-21-11
2	Field Verified Locations	VJA	VJA			4-25-11
3	Final for RI Report	EO	VJA	RC	RC	11-17-14

Mountain Top Pennsylvania

Uniform Scale
GeoPhysical Data Overlay

MIPS Area

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SPEC. NO.
CONTRACT NO.
PROJECT NO. 106-3947
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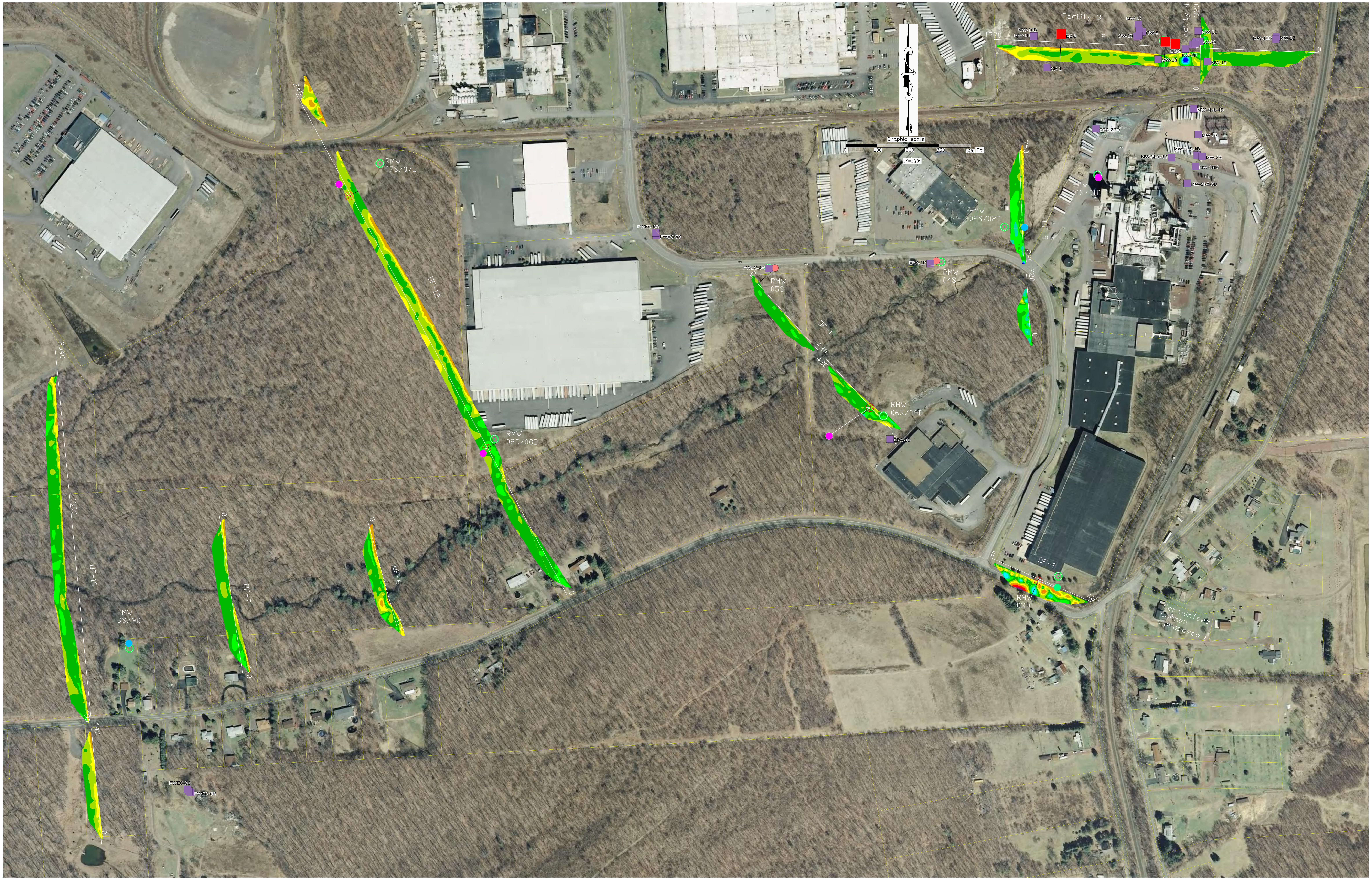
1 OF 1
E
DIS. SH. NO.



5.1	4.7	4.4	4.1	3.7	3.4	3.0	2.7	2.4	2.0	1.7	1.3	1.0	0.7	0.3	0.0

Electrical resistivity in log scale (Ohm-m)

Legend:

- Field Verified Proposed Well Locations
- Revised Proposed Well Locations
- Original Proposed RI Overburden/Bedrock Monitoring Well Cluster w/Rock Coring
- Original Proposed RI Overburden Monitoring Well
- Existing Monitoring Well
- Original Proposed RI Overburden/Bedrock Monitoring Well Cluster
- Original Proposed RI Bedrock Monitoring Well w/Rock Coring
- Exploratory Boring Location
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REV	DESCRIPTION	PREP'D	DSIGN'D	CHK'D	APRV'D	DATE
1	Preliminary edits	VJA	VJA			3-21-11
2	Field Verified Locations	VJA	VJA	RC		4-25-11
3	Final for RI Report	EO	VJA	RC		11-17-14

Mountain Top, Pennsylvania

Uniform Scale
GeoPhysical Data Overlay
South East Portion

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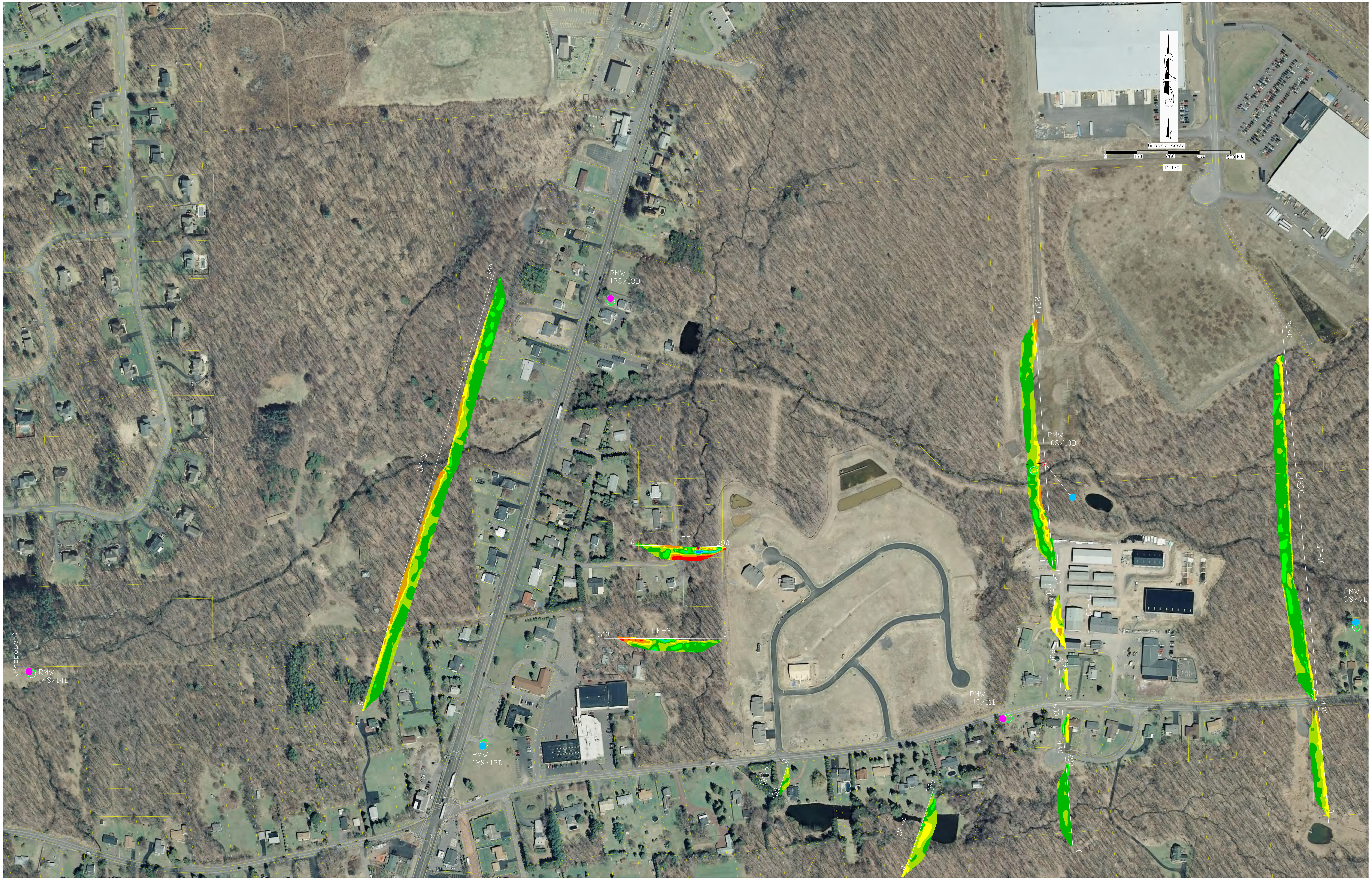

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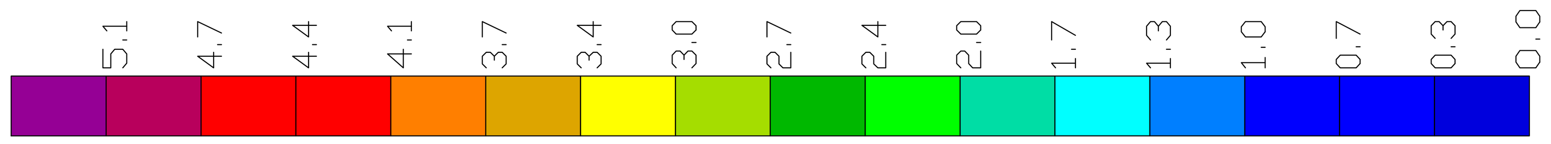

Electrical resistivity in log scale (□hm-m)

- Field Verified Proposed Well Locations
- Revised Proposed Well Locations
- □riginal Proposed RI □verburden/Bedrock Monitoring Well Cluster w/Rock Coring
- □riginal Proposed RI □verburden Monitoring Well
- Existing Monitoring Well
- □riginal Proposed RI □verburden/Bedrock Monitoring Well Cluster
- □riginal Proposed RI Bedrock Monitoring Well w/Rock Coring
- Exploratory Boring Location
- Matrix Diffusion Location

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REV	DESCRIPTION	PREP'D	DSIGN'D	CHK'D	APRV'D	DATE
1	Preliminary edits	VJA	VJA			3-21-11
2	Field Verified Locations	VJA	VJA			4-25-11
3	Final for RI Report	EO	VJA	RC	RC	11-18-14

Pennsylvania

Uniform Scale
GeoPhysical Data Overlay

South West Portion

Mountain Top

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